USER GUIDE

IMPORTANT!
READ ME FIRST

UltraBlock™

Digital Intelligence®
forensic solutions

N O T I C E

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There are no serviceable parts inside the UltraBlock. If you require service, do not attempt to open the UltraBlock device due to a shock hazard. Opening or disassembling the UltraBlock case (except at the request of DI Technical Support) will void the warranty.

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What is the UltraBlock?

UltraBlock is a hardware based write blocker that allows a disk drive to be connected to a personal computer for forensic image acquisition and analysis. Individual UltraBlock devices are available to support IDE (UltraBlock-IDE), Serial ATA (UltraBlock-SATA), and SCSI (UltraBlock-SCSI) disk drives. UltraBlock devices support connection to the Host PC via FireWire400(1394A), FireWire800 (1394B), or USB 1.X/2.0 interfaces. In addition, UltraBlock can also be customer configured to selectively provide Read-Write or Read-Only operation.

Power Considerations

UltraBlock may be powered from EITHER of two different type power sources. You may supply power via the 5-pin DIN connector (labeled “DC in A”) when using the UltraBlock Power Supply. As an alternative, UltraBlock accepts a standard 4-pin PC Power Molex type connector (labeled “DC in B”). **DO NOT connect both types of power simultaneously.**

The power selection switch on top of the unit is used as an ON/OFF switch. If you are supplying power via the “DC in A” port (UltraBlock Power Supply), then the unit will be powered ON when the switch is placed in the “A On” position. (Switch in “B On” position would be OFF).

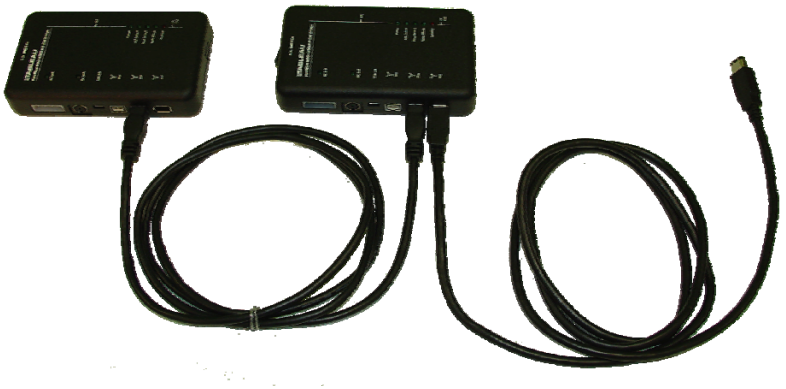
If you are supplying power via the “DC in B” port (PC “Molex” Power Connector), then the unit will be powered ON when the switch is placed in the “B On” position. (Switch in “A On” position would then be OFF).

Do not attempt to power more than one drive and one UltraBlock from the external power adapter. Attempting to power multiple drives and UltraBlock devices from a single external power supply may result in physical damage to the power supply and attached devices and will not be covered under warranty.

UltraBlock cabling to PC

You should only select a single cable/interface to connect the UltraBlock to your PC. Select EITHER a FireWire400, FireWire800, or USB connection on the UltraBlock.

If you wish to daisy chain (cascade) multiple UltraBlock devices you must use the FireWire interfaces. (USB devices can not be cascaded). In order to do this, connect your first UltraBlock to the PC using either a FireWire400 or a FireWire800 interface. Then use a bilingual FireWire800 cable to connect the first UltraBlock to the second UltraBlock. Additional UltraBlock devices can be daisy chained using this technique.



Drive Configuration

Note: Please consult the Hard Drive Manufacture for information on proper jumper configuration.

Before attaching an IDE disk drive to the UltraBlock-IDE, the drive **must** be configured (jumpered) as a **Single Master Device.**

The SCSI ID of the UltraBlock-SCSI device is factory configured to ID 7. It will automatically scan all device ID's from 0 to 15 in order to detect the attached drive. Therefore, a SCSI drive attached to the UltraBlock-SCSI may have any SCSI ID from 0 through 15 excluding ID 7. Termination on the SCSI Drive should be enabled.

Diagnostic LED's

Power LED's are provided to indicate power for the Power Supply ("DC in A") connector and the PC "Molex" connector ("DC in B"). An additional power LED ("Power") is provided to indicate when a live power source has been selected by the power switch.

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The “Host Detect” LED will indicate when the connected PC interface is properly detected.

The “ATA Detect” (UltraBlock-IDE), “SATA Detect” (UltraBlock-SATA), or “SCSI Detect” (UltraBlock-SCSI) LED’s illuminate when a disk drive is connected and recognized by the UltraBlock.

The “Activity” LED is used to indicate drive activity.

The “Write Block” LED will illuminate if the unit is operating in Read-Only mode. Furthermore, if the UltraBlock is attached to the PC via one of the FireWire interfaces it will also Flash when an attempted write is blocked. (No “write block flashing” will be performed if connected via the USB interface)

The UltraBlock SCSI has two additional LEDs mounted on the side of the unit between the HD68 SCSI and DC Out connectors. These LEDs indicate which type of SCSI bus is in use, LVD (Low Voltage Differential) or SE (Single Ended). The green LED indicates that the SCSI bus is in LVD mode, and the yellow LED indicates the bus is in SE mode. If neither LED is illuminated, you may be attempting to use an older HVD SCSI device that is not supported by the UltraBlock SCSI.

Drivers

No device specific drivers are required for the UltraBlock. Full driver support is provided by the Host Operating System and/or Interface Controller (FireWire or USB Adapter). Normally, the required drivers will automatically be loaded by the Operating System. (Please note that Windows 98 does not natively support USB Storage Devices). Please refer to your Operating System, Motherboard, or Host Adapter manufacturer for additional driver related information.

Cables

Use only high quality FireWire or USB cables. If you are connecting the UltraBlock to a USB 2.0 controller, be sure to use cables rated specifically for USB 2.0 transmission speeds.

Attaching the UltraBlock

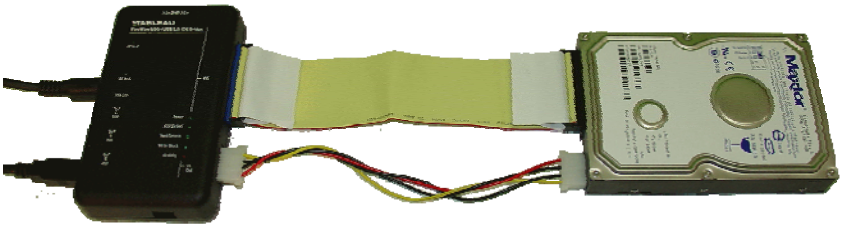
1. ***Confirm Power Switch is Off:*** If you will be providing power to the UltraBlock using the UltraBlock Power Supply, the power switch should be in the alternate “B On” position (OFF). If you will be providing power to the UltraBlock using the PC “Molex” type connector, the power switch should be in the alternate “A On” position (OFF).
2. ***Connect UltraBlock to the Hard Drive:*** Connect the UltraBlock to the drive using the appropriate data cable (IDE, SATA, or SCSI), and the drive power cable (connected to the “DC Out” port). If applicable, the IDE data

cable should be connected with the “Host” (Blue) connector attached to the UltraBlock.

3. ***Connect Power Supply to UltraBlock:*** If using an UltraBlock Power Supply, connect power to the 5-pin DIN “DC in A” port and plug the power supply in to 120/220V service. If you are using a PC “Molex” type power connector, connect it to the “DC in B” port.

4. ***Connect UltraBlock to PC:*** Connect the UltraBlock to your PC using EITHER a FireWire400, FireWire800, or USB cable.

5. ***Turn UltraBlock On:*** If are providing power to the UltraBlock using the UltraBlock Power Supply, the power switch should be placed in the “A On” position. If you are providing power to the UltraBlock using the PC “Molex” type connector, the power switch should be in the “B On” position.



Swapping Drives

1. ***“Stop”, “Unload”, or “Dismount” the associated USB or FireWire device using the applicable Operating System Icon, Process, or Utility.*** This will notify the operating system to complete any pending transfer operations such that the device can be properly disconnected.

2. ***Turn UltraBlock Off:*** If you are be providing power to the UltraBlock using the UltraBlock Power Supply, the power switch should be placed in the alternate “B On” position (OFF). If you are be providing power to the UltraBlock using the PC “Molex” type connector, the power switch should be placed in the alternate “A On” position (OFF).

3. ***Remove existing drive:*** Disconnect the data and power cables from the disk drive.

4. ***Attach New Drive:*** Attach the data and power connectors to the new disk drive.

5. ***Turn UltraBlock On:*** If are providing power to the UltraBlock using the UltraBlock Power Supply, the power switch should be placed in the “A On” position. If you are providing power to the UltraBlock using the PC “Molex” type connector, the power switch should be in the “B On” position.

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Disconnecting the UltraBlock:

1. ***"Stop", "Unload", or "Dismount" the associated USB or FireWire device using the applicable Operating System Icon, Process, or Utility.*** This will notify the operating system to complete any pending transfer operations such that the device can be properly disconnected.
2. ***Turn UltraBlock Off:*** If you are be providing power to the UltraBlock using the UltraBlock Power Supply, the power switch should be placed in the alternate "B On" position (OFF). If you are be providing power to the UltraBlock using the PC "Molex" type connector, the power switch should be placed in the alternate "A On" position (OFF).
3. ***Disconnect UltraBlock from PC:*** Disconnect the FireWire or USB cables from the PC and the UltraBloc
4. ***Disconnect Power Supply from UltraBlock*** and unplug from 120/220V service as applicable
5. ***Disconnect Drive from UltraBlock:*** Disconnect the data and power cables from the disk drive and UltraBlock.

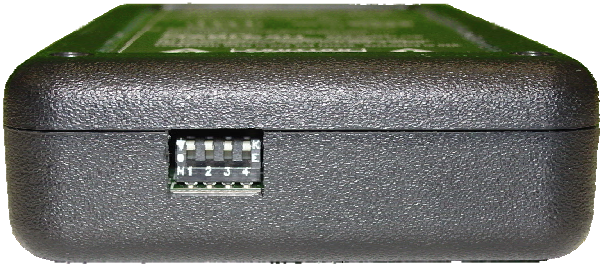
Modifying your UltraBlock to enable Read/Write Capabilities

The UltraBlock is shipped by default in a Read-Only (write blocking) configuration. However, the units can be configured to selectively enable Read-Write operation as well. Digital Intelligence recognizes that it may be desirable to have a unit that can not be inadvertently altered to enable writes, and as such, has made it necessary for the customer to make a simple modification to the housing to enable this capability. For those customers who have stricter requirements, dedicated firmware is also available to prevent the unit from being configured for Read-Write Operation. Modifying the UltraBlock to enable Read-Write capabilities will not affect the warranty provided it is done properly.

NOTE: The YELLOW UltraBlock-IDE shipped in the UltraKit is by default preconfigured in Read-Write Mode

In order to enable Read-Only / Read-Write selectivity there is a small panel located on the bottom edge of the unit which must be knocked out. A small razor knife is ideal for this operation. Once this panel is removed, you can access the device configuration dip switches with a small screwdriver or pen. (See illustration)

The default position for all switches is OFF (Read-Only).



Generally, the only switch you should need to manipulate is switch #1. When this switch is ON the unit will operate with writes enabled (Read-Write). When this switch if OFF the unit will operate with all writes being blocked (Read-Only).

Switches #2 and #3 control how the unit responds when placed in Read-Only mode and are intended for diagnostic operations and to help support Operating systems which do not fully support read-only devices. These switches are ignored if the unit is configured for Read-Write.

Switch #2 controls whether an error code is returned when a write is attempted. If the switch is OFF, an error will be generated when a write is attempted. If the switch is on, a success code will be returned to make believe the write succeeded.

Switch #3 controls what type of code page (device characteristics) is reported to the calling process when a device query is made. If the switch is OFF, the code page is reported appropriately to indicate that the device is write protected. If the switch is ON, the code page is reported as if the device was not write protected.

Summary of Switch Settings

Switch 1: OFF = Read-only (write-blocking enabled)
ON = Read-write

Switch 2: Only functions if Switch 1 = OFF, i.e., read-only
OFF = Unit reports errors if writes are attempted
ON = Unit suppresses errors if writes are attempted (no-error

Switch 3: Only functions if Switch 1 = OFF, i.e., read-only
OFF = Unit reports Write-Protect (WP) status in code page
ON = Unit suppresses Write-Protect (WP) status in code page

Switch 4: Reserved

Important Considerations

Removal of Drives. **DO NOT** disconnect the drive from the UltraBlock while the unit is powered up.

Do Not Use USB Cable Extenders. When operating the UltraBlock device via

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the USB interface it is important to understand that the USB communication specification does NOT permit cable extenders such as those used to bring the USB connector to the front of the computer. A number of name-brand computer, motherboard, and case manufacturers have adopted the practice of bringing the USB connector to the front of the computer by using a cable extender even though this practice is not compliant with the official USB specification. Unfortunately, these "remote" front-panel connections can never be as reliable as the direct-to-the-circuit-board USB connectors typically found at the rear of the computer. If you have trouble using a front-panel USB connection, we advise you to use the rear USB connectors instead. Also, data integrity issues may be more apparent when using the higher bit rates of USB 2.0 communication via these remote connections. In the event that you wish to use a “remote” USB connector, you should only use the highest quality USB 2.0 cables and validate the integrity of the resulting configuration to your fullest satisfaction.

Disk Cache. Be aware, when used with Operating Systems which cache disk writes (Windows 95/98/ME for example), it may appear information has been written to the drive when viewed with Windows Explorer, in actuality this information has only been stored in the disk cache. A reboot of GUI based Operating Systems will clear and refresh the disk cache showing that no information has been written to the drive. Pressing “CTRL-C” in MS-DOS will cause the disk cache to be reset and demonstrate this fact as well. Since properly designed Forensic Imaging software reads directly from the disk itself, the contents of the Operating System disk cache should be of no consequence should something inadvertently be written there. (This includes the “_Restore” directory created by Windows ME).

NTFS Drive Letter Access. Also be aware than Windows NT/2K/XP may attempt to update (write to) to an NTFS file system the first time it is attached to a system. In the event that Windows tries to perform this update, and writes to the drive are being blocked, Windows will then refuse to provide logical disk access to the associated file system. This will effectively result in an NTFS file system for which no drive letter access is provided. Windows is essentially refusing to mount a file system because it could not update the respective structure. This condition is a function of the Windows NT/2K/XP operating system and happens specifically because the Write Blocker is performing properly. Although logical disk access will not be provided under this circumstance, the associated drive can still be imaged from a physical perspective without any interference from the O/S.

NOTES

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